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ABSTRACT

Student teachers using and evaluating two alcohol education microcomputer simulation programs during their student teaching experience: (1) gained experience in utilizing the microcomputer for teaching a health topic, and (2) provided an opportunity to determine whether differences exist between student and teacher opinions about health education software. Secondary school students (n=68) and teachers (n=15) participating in the software review basically held similar opinions. They agreed on five of the seven items relating to the way the programs ran. Students and teachers disagreed on how the programs handled responses, accuracy of program content, and whether or not the lesson was boring. It would appear from a formative evaluation done by two student teachers that student and teacher opinions are not significantly different when judging software. As health education software is developed and used in the in the classroom, on-going evaluation will need to be conducted to determine how it affects the learner as well as how effective it is as a method of teaching. Introducing student teachers to using microcomputers as a method of teaching provides them with broader experience in computer literacy. (JD)

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PROMOTING COMPUTER LITERACY IN HEALTH EDUCATION

B. Sue Beall

One objective of computer literacy for teachers is being able to use a variety of preprogrammed computer software in teaching, and being able to determine the value of computer programs for instructional purposes. Cobern, Kelman, Roberts, Snyder, Watt and Weiner (1982) have proposed that citizens in a computer-based society need to be literate with computers in the same way that people need to be literate with the languages they speak, read and write. Research which determines what value or usefulness computer programs have for instructional purposes in health education appears to be scant (DeSonior, 1982; Ellis & Raines, 1982; Somand, 1981). These studies indicate that Computer Assisted Instruction (CAI) in health education may improve health knowledges and attitudes. The literature reviewed did not address the usefulness of microcomputer programs in the high school health education class. This paper addresses the comparison of student ratings and teacher ratings for two pieces of alcohol education software.

PURPOSE

The primary purpose of this project was to provide student teachers in health education experience in utilizing the microcomputer for teaching a health topic. To do this a research project was designed to evaluate the usefulness of two alcohol education simulation programs, "Beer Bust" and "Time Out," which were used with two high school health education classes during an instructional unit on alcohol education. The secondary purpose was to determine if similarities occurred between student perceptions and teacher perceptions of the alcohol education simulation programs "Beer Bust" and "Time Out" during the formative evaluation of the two simulation programs.

PROCEDURE

To determine the usefulness of the two microcomputer programs the opinions of students and the opinions of teachers were compared. The software was reviewed by 15 teachers, and 68 students. The students were enrolled in health education classes in two high schools in Bryan, Texas. Five of the teachers were computer literacy teachers and 10 were health educators (six were secondary school health educators and four were pre-service student teachers in health education). There were 30 students in grades 10-12 and 38 in grade nine who evaluated the two alcohol education simulation programs.

The evaluation instruments completed by the student groups and the instrument completed by the faculty group were matched in content over 13 items on Likert

Scales. The ninth grade group (N = 38) was given a 13 item Likert Scale, which was the short form of the evaluation instrument used to evaluate the alcohol education simulation programs entitled "Beer Bust" and "Time Out". The rating scale utilized with the teachers and senior high school students (grades 10-12) included 18 Likert Scale items and four ranking items. The longer instrument is shown in Figure 1 with the 13 matched items marked with an asterisk.

Figure 1

"BEER BUST" AND "TIME OUT" EVALUATION

Please rate the following characteristics of the two alcohol simulation programs on the following scale:
(SA) = Strongly Agree (A) = Agree (NO) = No Opinion
(D) = Disagree (SD) = Strongly Disagree

*1.	Content is accurate	SA	A	NO	D	SD
*2.	Program is free of stereotypes (Sex Race, Age, Ethnic or Religious)	SA	A	NO	D	SD
*3.	Screen is easy to read, well spaced and uncluttered	SA	A	NO	D	SD
*4.	The program is easy to use	SA	A	NO	D	SD
*5.	All visuals are well designed and accurate	SA	A	NO	D	SD
*6.	The program is free of errors	SA	A	NO	D	SD
*7.	Instructions are clearly stated and complete	SA	A	NO	D	SD
*8.	Language level is appropriate for your age group	SA	A	NO	D	SD
*9.	Program defines new words	SA	A	NO	D	SD
*10.	I enjoyed the program "Beer Bust"	SA	A	NO	D	SD
*11.	I enjoyed the program "Time Out"	SA	A	NO	D	SD
*12.	I was totally bored with this lesson using the microcomputer	SA	A	NO	D	SD
*13.	This computer activity was a nice change from the usual class activities	SA	A	NO	D	SD
14.	There is a clear indication of the desired response	SA	A	NO	D	SD
15.	The program is self-paced	SA	A	NO	D	SD
16.	Illustrations are used to emphasize important information	SA	A	NO	D	SD
17.	Program handles inappropriate responses effectively	SA	A	NO	D	SD
18.	Instructions are present with the program	SA	A	NO	D	SD

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Please rank the following items from one (1) to five (5) where 1 = low and 5 = high.

19. The MOST appropriate setting (where) for the computer program "Beer Bust" in health education is:
    health instruction classroom
    teen clinics
    library/instructional resource center
    youth groups (Girl Scouts, 4-H, Church groups)
    counselor's office

20. The MOST appropriate setting (where) for the computer program "Time Out" in health education is:
    health instruction classroom
    teen clinics
    library/instructional resource center
    youth groups (Girl Scouts, 4-H, Church groups)
    counselor's office

21. The MOST appropriate population (who) for these two computer programs in health education is:

Beer Bust	**Time Out**
7-9th grades	7-9th grades
10-12th grades	10-12th grades
4-6th grades	4-6th grades
teachers	teachers
parents	parents

22. The MOST appropriate implementation (how used) for these two computer programs in health education is:

Beer Bust	**Time Out**
In drug education program	In drug education program
To motivate discussion	To motivate discussion
To clarify values	To clarify values
To emphasize responsibility	To emphasize responsibility
In a free period for individual use	In a free period for individual use

The two microcomputer simulation programs were utilized as a class activity during an alcohol education unit taught by two student teachers during the Spring semester, 1984. Each student teacher had taught alcohol information prior to the utilization of the simulation programs, and both used the lecture with discussion methodology to teach about alcoholic beverage use and abuse. The data were collected from students immediately after they had used the two simulation programs one time. Data were collected from the computer literacy and health education teachers by mail and in person. The teachers were asked to progress through the programs only one time prior to completing the evaluation form.

The two simulation programs were utilized by two student teachers to establish a base of information on how students evaluated health education software and how they felt about using the microcomputer in the classroom to teach health education. The simulation programs were further utilized by the student teachers to assist them in meeting three objectives: 1) to define BAL (blood alcohol level); 2) to list three immediate effects of drinking alcoholic beverages and three long term effects of drinking alcoholic beverages; and 3) to review steps of the decision making process

used when given an alcoholic beverage drinking simulation. Since the computer programs were not used as the sole means of instruction, no attempt was made to determine the effectiveness of this method in attaining these objectives.

The software evaluation data collected from students and teachers were treated with the chi-square technique to determine the relationship between student opinion, and teacher opinion on usefulness of the software. The chi-square technique was utilized to determine the degree of relationship between student and teacher favorableness toward using microcomputer programs as a method of teaching and learning health education.

RESULTS

Response frequencies to each item on the opinion scales were compared for each of the three groups, ninth grade students, 10-12 grade students, and teachers. Significant differences were noted on four of the items. Table 1 presents the item numbers, their chi-square values and their accompanying level of significance.

Table 1

ITEMS SHOWING SIGNIFICANT DIFFERENCES IN OPINIONS OF STUDENTS AND TEACHERS

Item	Chi-Square	DF	P
# 1	15.3	4	0.0047
#12	24.8	4	0.0002
#14	6.2	2	0.0435
#17	11.0	2	0.0046

The .05 level of significance was set apriori, and each of the four items in Table 1 met that criteria. Further chi-square tests to determine which groups demonstrated the greatest degree of difference in opinions were conducted on each of these four items. Each of the two student groups and the teacher group responses to the Likert scale produced a three by five contingency table for each of the items. This comparison produced a number of cells with less than five frequencies. For this reason the *Strongly Agree* and *Agree* cells were collapsed together and the *Disagree* and *Strongly Disagree* cells were collapsed together to produce a three by three contingency table with more frequencies in each cell.

For item #1, "The content is accurate", the responses of the three groups were significantly different. The significant difference existed between the opinions of all students and the teachers. A chi-square of 15.3, df = 4, and a P of 0.0047 for these three groups was noted. Significant differences were also noted between each of the three groups when the chi-square was applied to determine where the greatest differences existed between groups. Teachers and senior high students generally agreed with the statement, while ninth grade students disagreed with the statement.

Item #12, dealing with being bored by the two simulation activities on the microcomputer, produced significant differences between all three groups. Further chi-square tests between the three groups demonstrated that ninth graders generally held no opinion or agreed that the computer activities were boring. The 10-12 grade students tended to have no opinion or disagreed with this statement, and teachers tended to disagree with this statement.

The remaining items did not produce significant differences in responses by the two groups of students or teachers. Generally the students and teachers agreed that: 1) the programs were free of stereotypes; 2) the screen seemed easy to read; 3) the program was easy to use; 4) all visuals seemed well designed; 5) instructions were clearly stated and complete; 6) language was appropriate for the age groups; 7) each simulation program defined new words; 8) they enjoyed using the "Beer Bust" and "Time Out" programs; and 8) the computer activity was a nice change from other health education class activities.

Since items #14 and #17 were not on the short form of the instrument they were completed by the 10-12 grade students and teachers. For item #14, "There is a clear indication of the desired response", there was a significant difference in opinion between students and teachers. A chi-square value of 6.0, df = 2, and P = .0435 was noted for this item. The students tended to agree with or have no opinion about this statement, while the teachers were divided in agreement or disagreement to this statement. On item #17, "The program handles inappropriate responses appropriately", there were significantly different responses for the students and teachers. The chi-square of 11.0, df = 2, and P = .0046 on this item indicated the difference statistically of their opinions. The teachers generally had no opinion or disagreed that the programs handled inappropriate responses effectively, whereas students either agreed or had no opinion about how the programs handled inappropriate responses.

Table 2

MOST APPROPRIATE SETTING FOR USE OF "BEER BUST" AND "TIME OUT" MICROCOMPUTER SIMULATION PROGRAMS

Setting	Student Ranking	Teacher Ranking
"Beer Bust":		
Health Education Classroom	3	1
Teen Clinics	1	2
Library/Instruction resource center	2	3
Youth Groups (scouts, church etc.)	4	4
Counselor's Office at school	5	5
"Time Out":		
Health Education Classroom	4	1
Teen Clinics	3	3
Library/Instruction resource center	1	2
Youth Groups (scouts, church etc.)	2	4
Counselor's Office at school	5	5

Six items for ranking the most appropriate setting for use of the two simulation programs and the most appropriate population with whom the programs should be used were included in the instrument given to 10-12 grade students and teachers. The results of these data are presented in Tables 2 and 3.

Table 3

MOST APPROPRIATE AGE GROUP FOR USE OF MICROCOMPUTER PROGRAMS "BEER BUST" AND "TIME OUT"

Age Group	Student Ranking	Teacher Ranking
Beer Bust:		
Grades 7-9	3	2
Grades 10-12	1	1
Grades 4-6	5	4
Teachers	4	5
Parents	2	3
Time Out:		
Grades 7-9	2	2
Grades 10-12	1	1
Grades 4-6	4	5
Teachers	5	4
Parents	3	3

Table 4 illustrates the average rankings for the students (grades 10-12) and the teachers on the most appropriate way to use the two alcohol simulation programs.

The mean rankings were computed for both groups on the most appropriate setting in which the programs should be used, the most appropriate age groups to use the programs, and the most appropriate use of the two programs. The Spearman-Brown Rank Correlation technique was applied to average rankings given by students and teachers on the appropriateness of each of the two simulation programs. Mean rankings for students and teachers on the most appropriate setting for both programs were not closely related. A .70 correlation coefficient was obtained for the "Beer Bust" simulation and a .30 correlation coefficient was obtained for the "Time Out" simulation. Mean ranks comparison on the most appropriate age group with whom the simulation programs should be used provided a correlation coefficient of .90 for "Beer Bust" and a .80 for "Time Out". The correlation of mean ranks on the most appropriate use of the simulation programs produced a correlation coefficient of .90 for "Beer Bust" and .58 for "Time Out."

DISCUSSION AND CONCLUSION

Student teachers using and evaluating software in their health education teaching experience provided validation data regarding use of microcomputer programs in the

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Table 4

MOST APPROPRIATE WAY TO USE THE SIMULATION PROGRAMS: "BEER BUST" AND "TIME OUT"

Use of Program	Student Ranking	Teacher Ranking
Beer Bust:		
Only in drug education program	3	3
To motivate discussion in health education class	5	4
As values clarification activity	2	2
Activity to emphasize Self-responsibility	1	1
Free period activity for individual use	4	5
Time Out:		
Only in drug education program	5	3
To motivate discussion in health education class	4	4
As values clarification activity	3	2
Activity to emphasize Self-responsibility	1	1
Free period activity for individual use	2	5

health education classroom. Seven items administered to both teachers and students which dealt with the way the programs progressed or ran free of errors were: #4 (program is easy to use), #6 (program is free of errors), #7 (instructions are clear and complete), #14 (clear indication of desired response), #15 (program is self paced), #17 (program handles inappropriate responses effectively), and #18 (instructions are present with the program). Of this group only items #14 and #17 produced a significantly different response from either group of high school students or teachers when the five levels of responses were collapsed into three levels *agree, no opinion, and disagree*.

The evaluation instrument included items which checked opinions about how the graphics and framing appeared, as well as whether or not stereotypes were present. There were two items which dealt with graphics and frame appearances, #3 and #5. Opinions of students and teachers were similar on these items. Only one item (#2) addressed the issue of whether the programs were free from stereotypes, and this item produced no statistically different variation of opinion between students and teachers.

Four items dealt with how effective the programs were as a method of teaching or learning, or how much the simulation programs were enjoyed as a health education class activity. These were items #10 (I enjoyed the "Beer Bust" Program), #11 (I enjoyed the "Time Out" Program), #12 (I was totally bored with this activity), and #13 (the computer activity was a nice change of pace). Item #11, dealing with enjoyment of the "Time Out" program, was somewhat similar for all groups. Teachers and students were similarly divided on their agreement, disagreement or no opinion to the question. Generally, they agreed or had no opinion about that item. The teachers, however, had a wider variation in opinion with some agreeing, some with no opinion and some disagreeing with the item. Item #12, "I was totally bored with this

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lesson", produced significant differences between all three groups. The contingency table of observed frequencies showed a definite trend for ninth grade students to agree or have no opinion, students in grades 10-12 either had no opinion or disagreed and teachers totally disagreed with the item. Teachers may have enjoyed the simulation programs as an activity more than the students. At least they seemed to not be bored as much as students were, or they responded more carefully to all items in the instrument. This item was the only negatively stated item in the instrument, and the response mode may have prompted students to continue marking in the some way. Another explanation of that difference might be related to classroom management. The classroom setting was somewhat different for 10-12 grade students than for the ninth grade students. There were two students for each computer in the ninth grade and four students for each computer in grades 10-12. Accompanying desk work time was longer for the senior high group than for the ninth grade group. In both classroom settings each student was allowed to progress through each program one time. This did not insure that computer time was the same for each student. The nature of the simulation programs depends on user decisions. If non-drinking decisions were made throughout the program, the student progressed faster. With each decision to drink more beer or alcoholic beverage, the user was presented more information. This might indicate that the ninth grade students spent less time looking at the programs. One additional evaluation to consider in the future with simulation programs is the pathway of the user through the program. If the full program is not seen, perhaps the user's evaluation is not valid. A number of repetitions through the program might insure this validity.

The ninth grade group and teacher group opinions were different from 10-12 grade student opinions on item #1. The only explanation the investigator can give for these differences is that perhaps the senior high group felt they were more knowledgable about alcoholic beverages than the information presented in the simulation programs.

No attempt was made in this study to determine the reading level of the programs. Further investigation of reading level would be appropriate at this time to determine if it is above or below the average high school student reading ability. Item #9, "Programs define new words", produced no significant differences between groups. The responses to this item indicated that new words were defined clearly for the user.

Student teachers using and evaluating health education software in the student teaching experience provided an opportunity to determine what differences exist between student and teacher opinions about health education software. This formative evaluation of two simulation programs in alcohol education indicated that students and teachers basically held similar opinions about the software. Students and teachers agreed on five of the seven items relating to the way the programs ran. The 10-12 grade students and teachers disagreed on how the programs handled responses, accuracy of program content, and whether or not the lesson was boring. It would appear from this formative evaluation done by two student teachers during a unit of study in health education that student and teacher opinions are not significantly different when judging health education software.

As health education software is developed and utilized in the classroom, ongoing evaluation will need to be conducted to determine how it affects the learner as well as how effective it is as a method of teaching. Introducing student teachers to using

microcomputers as a method of teaching provides them with a broader experience in computer literacy. Student teachers and teachers learn that opinions of students and teachers are important to determine the usefulness of health education software. As computer literacy is sought in the classrooms of our schools, teachers in every discipline will share in that pursuit. As teachers in health education attempt to find appropriate software and appropriate uses for that software, formative evaluation of this type will be necessary.

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